

# AUTHOR INDEX TO VOLUME 36

## A

Acharya, D. R. ....	1610
Ackley, M. W. ....	1229
Adachi, K. ....	738
Akgerman, A. ....	1054, 1715, 1743
Albalak, R. J. ....	1313
Albright, D. E. ....	1555
Aldis, D. F. ....	1087
Alishusky, J. J. ....	1605
Allen, D. T. ....	773, 1617, 1707
Allison, B. J. ....	1075
Almasy, G. A. ....	1321
Al-Ubadi, B. H. ....	141
Ananth, M. S. ....	370
Anderson, D. H. ....	809
Anselme, M. J. ....	897
Anthony, R. G. ....	794, 1054
Anturkar, N. R. ....	710
Apte, V. B. ....	461
Arrua, L. A. ....	1768
Asai, S. ....	1331

## B

Babu, S. V. ....	871
Bailey, R. V. ....	598
Balakotaiah, V. ....	397, 1905
Banba, N. Yoshioka, Y. ....	738
Barbe, D. T. ....	1421
Bardakci, T. ....	469
Bashir, Y. ....	387
Basu, R. ....	450
Baud, R. E. ....	293
Bauer, J. S. ....	147
Beckman, L. V. ....	598
Behmanesh, N. ....	1707
Belfort, G. ....	547
Beltran, J. ....	1263
Benitez, F. J. ....	1263
Berglund, K. A. ....	1669
Beris, A. N. ....	1439
Bezanson, L. ....	283
Bhandarkar, S. ....	1536
Biardi, G. ....	576
Biddulph, M. ....	1913
Blake, T. R. ....	361
Blanch, H. W. ....	1425, 1485

Boersma, W. H. ....	321
Bohrer, M. P. ....	216
Bond, G. A. ....	473
Boyadjiev, C. B. ....	132
Brennecke, J. F. ....	1927
Brenner, H. ....	1403
Briggs, D. E. ....	19
Britten, J. A. ....	801
Brodkey, R. S. ....	1457
Bukur, D. B. ....	93, 1731
Bulow, M. ....	1500
Bultitude, D. P. ....	1913
Butt, J. B. ....	157
Byers, C. H. ....	1220

## C

Cabezas, H. ....	1908
Cai, P. ....	955
Callow, A. D. ....	994
Camera, G. ....	851
Campbell, G. A. ....	420
Cao, B. ....	420
Cao, G. ....	1032
Carpenter, M. K. ....	1097
Carra, S. ....	1736
Carreau, P. J. ....	1613
Carroll, T. A. ....	1046
Carta, G. ....	147, 1220
Caussade, B. ....	265
Cen, P. ....	789
Chaikof, E. L. ....	994
Chan, A. C. ....	765
Chan, S. W. ....	75
Chandhok, A. ....	1259
Chandran, A. N. ....	29
Chang, C. J. ....	939
Chao, Y. C. ....	1025
Cheetham, W. J. ....	1075
Chen, C. L. ....	1025
Chen, P. L. ....	1025
Cheng, W. C. ....	559
Chern, J. M. ....	1200
Chien, Y. S. ....	951
Chimowitz, E. H. ....	1163
Ching, C. B. ....	275
Chiwetelu, C. I. ....	233
Cho, W. ....	1891

Choudhary, V. R. ....	1577
Chu, K. H. ....	275
Clough, S. J. ....	75
Coleman, J. E. ....	994
Connolly, R. J. ....	994
Cooney, C. L. ....	299
Cooney, D. O. ....	1430
Core, K. L. ....	1137
Coyle, D. J. ....	161
Crovetto, R. ....	1901
Cui, L. C. ....	86
Czarnecki, L. J. ....	794
Czernicki, M. ....	1349

## D

Dahl, S. ....	1829
Dallmer, M. F. ....	640
Daly, J. G. ....	93, 1731
Dandekar, H. W. ....	1649
Dankworth, D. C. ....	605
Danner, R. P. ....	1625
Daoutidis, P. ....	1471
Darivakis, G. S. ....	1189
Datta, R. ....	916
David, M. M. ....	871
De Carli, J. P. ....	1220
Debenedetti, P. G. ....	1289, 1927
de Lasa, H. I. ....	1763
Deo, M. D. ....	1585
Derebail, R. ....	641
Dhurjati, P. S. ....	565
Diamond, A. D. ....	1017
Dickey, L. C. ....	640
Ding, J. ....	523
Dixon, D. C. ....	633
Doherty, M. F. ....	39, 969
Domenech, S. ....	1349
Domenichini, R. ....	576
Donohue, M. D. ...	1851, 1920, 1928
Douglas, W. J. ....	1370
Dowlati, R. ....	765
Dudokovic, M. P. ....	127
Dukler, A. E. ....	1379
Dumont, G. A. ....	1075
Durning, C. J. ....	877

**E**

Eckert, C. A. ....	1927
Economou, I. G. ...	1851, 1920, 1928
Edgar, T. F. ....	985, 1891
Edwards, C. M. ....	1680
El, M. M. ....	1209
Ensley, B. D. ....	639
Entner, R. ....	1500
Erickson, J. ....	299
Erkey, C. ....	1715
Esmail, M. N. ....	1283
Estrin, J. ....	1536
Eubank, P. T. ....	1661

**F**

Faeth, G. M. ....	818
Fair, J. R. ....	157
Fan, L. S. ....	439
Fan, L. T. ....	1529
Farhat, S. ....	1349
Farooq, S. ....	310
Fidkowski, Z. T. ....	1275
Fitch, B. ....	1545, 1779
Fitchett, D. E. ....	511
Flagan, R. C. ....	409
Fogler, H. S. ....	827
Foley, H. C. ....	1439
Font, R. ....	3, 633
Fontana, M. ....	576
Forney, L. J. ....	1773
Fortmann, C. M. ....	1555
Fortuin, J. M. ....	805, 961
Foss, A. S. ....	1779
Fournier, R. L. ....	1605

**G**

Gahne, O. ....	746
Gaikwad, R. P. ....	677
Gamba, G. ....	1736
Garcia, F. ....	151
Gauglitz, P. A. ....	1176
Geary, N. W. ....	1339, 1421
George, J. ....	265
Ghannam, M. T. ....	1283
Gidaspow, D. ....	523, 885, 1087
Gilles, E. D. ....	1697
Goddard, J. D. ....	387
Goldblum, D. K. ....	19
Graham, W. R. ....	1796
Grandjean, B. P. A. ....	1613
Gray, G. E. ....	1773
Griffin, T. A. ....	861

Gu, T. ....	784, 1156
Guiochon, G. ....	1722
Gunn, D. J. ....	1449
Guo, X. ....	641
Gupta, R. B. ....	333
Gustafson, J. B. ....	1439
Guzman, A. G. ....	1061

**H**

Haagblom, K. E. ....	1107
Hagh, B. F. ....	773
Hahnenstein, I. ....	1807
Hall, C. K. ....	1517
Hall, K. R. ....	1661
Hamersma, P. J. ....	805
Hamielec, A. E. ....	837
Hammer, B. E. ....	574
Hanley, T. R. ....	1011
Hanratty, P. J. ....	127
Hanson, F. V. ....	1585
Harrison, B. K. ....	291
Hart, J. ....	805
Harvey, A. H. ....	539, 1901
Hasse, H. ....	1807
Hatzikiriakos, S. G. ....	677
Hazlebeck, D. A. ....	1145
Hazlett, J. D. ....	1279
Heath, C. A. ....	547
Heeb, T. G. ....	1457
Heidemann, R. A. ....	333
Helfferich, F. G. ....	1200
Henson, M. A. ....	1753
High, M. S. ....	1625
Hill, R. F. ....	1061
Hlavacek, V. ....	1649
Ho, T. C. ....	685
Holodnick, S. E. ....	19
Holzhauser, C. ....	1054
Hornof, V. ....	233
Hounslow, M. J. ....	106, 1748
Howard, J. B. ....	1189
Hsu, J. T. ....	1017
Hu, R. ....	342, 685
Huang, H. P. ....	1025
Huang, S. H. ....	468
Hughes, R. ....	1610

**I**

Ihm, S. K. ....	1641
Ikonomou, G. D. ....	1851
Irandoost, S. ....	746
Ito, Y. ....	1003

**J**

Jacobsen, E. W. ....	753, 1121
Jasti, J. K. ....	827
Jin, Y. ....	955
Johnston, K. P. ....	1927

**K**

Kabiri, M. ....	1908
Kaji, N. ....	1039
Kamath, V. A. ....	1931
Kang, Y. ....	1255
Kanno, M. ....	1003
Karger, J. ....	1500
Kataoka, T. ....	1815
Katti, A. M. ....	1722
Kawaji, M. ....	765
Kecskes, L. J. ....	1581
Kelley, F. D. ....	1163
Kennedy, C. R. ....	809
Kenney, C. N. ....	53
Kevrekidis, I. G. ....	605
Kew, J. W. ....	1115
Khambanonda, T. ....	66
Khare, S. ....	1592
Khilar, K. C. ....	431
Kim, D. H. ....	302
Kim, I. W. ....	985
Kim, S. ....	927
Kim, S. D. ....	1255
Kimura, S. ....	907, 1118
King, F. G. ....	469
King, R. ....	1697
Kittrell, J. R. ....	779
Klein, J. ....	565, 1121
Klein, M. T. ....	1129
Klinzing, G. E. ....	157
Knapp, J. P. ....	969
Komori, S. ....	957
Konishi, Y. ....	1331
Kotamarthi, V. R. ....	916
Kottke, T. W. ....	1581
Kousaka, Y. ....	409
Krambeck, F. J. ....	809
Kramer, M. A. ....	1121
Kramlich, J. ....	1865
Kravaris, C. ....	249, 1471
Krishna, A. S. ....	779
Krishnaswamy, P. R. ....	1115
Krolikowski, L. ....	1275
Kutowya, O. ....	1279

**L**

Ladisch, M. R. ....	1156
Lakota, A. ....	1444

Larson, M. A. ....	1896
Laven, J. ....	321
Law, V. J. ....	598
Lee, J. ....	1891
Lee, S. P. ....	1763
Leighton, D. T. ....	1259
Leung, J. C. ....	797
Levec, J. ....	1444
Levelt Sengers, J. H. ....	539, 1901
Li, K. ....	1610
Liebman, M. J. ....	985
Liekhus, K. J. ....	1011
Lien, K. M. ....	1601
Liguras, D. K. ....	1617
Limbach, K. ....	242
Lin, H. M. ....	1597
Lin, L. C. ....	1585
Lin, S. Y. ....	1785
Lin, Y. R. ....	1597
Lin, Y. S. ....	1569
Liou, C. T. ....	951
Liow, J. ....	53
Lipscomb, G. ....	1505
Littel, R. J. ....	1633
Loth, E. ....	818
Lovo, M. ....	1905
Lu, S. Y. ....	927
Lucia, A. ....	641
Lundberg, B. A. ....	283
Lundstrom, P. ....	753, 1121
Luss, D. ....	397
Luthra, N. P. ....	559
Lynch, D. T. ....	1796

## M

Ma, Y. H. ....	1569
Ma, Z. ....	1722
MacGregor, J. F. ....	837
Machida, H. ....	738
Macosko, C. W. ....	161
Mahadevan, H. P. ....	1517
Mahalingam, R. ....	117
Maldarelli, C. ....	1785
Mamman, A. S. ....	1577
Mancy, K. H. ....	19
Mandava, S. ....	1680
Manousiouthakis, V. ....	1209, 1707
Marrucci, G. ....	13
Masbernat, L. ....	265
Matous, J. ....	479
Maurer, G. ....	1807
McAuley, K. ....	837
McCarthy, M. J. ....	287
McCoy, B. J. ....	1768, 1933
McCready, M. J. ....	1259

McKeigue, K. ....	1785
McLaughlin, J. B. ....	157
Mehdizadeh, S. ....	877
Mellichamp, D. A. ....	1391
Merrill, E. W. ....	994
Michelsen, M. L. ....	1829
Min, B. T. ....	1255
Minoura, T. ....	361
Mirer, S. D. ....	547
Mixon, D. A. ....	216
Mochizuki, T. ....	1039
Mohanty, R. ....	1536
Morbidelli, M. ....	1032, 1736
Mori, Y. H. ....	1039, 1272
Mulligan, J. C. ....	1137
Murad, S. ....	948
Murakami, Y. ....	957

## N

Nabetani, H. ....	907
Nagaosa, R. ....	957
Nah, J. B. ....	1255
Nakajima, M. ....	907
Nakamura, S. ....	1003
Nakao, S. I. ....	907, 1118
Narasimhan, S. ....	1589
Nassar, R. ....	1529
Neale, G. H. ....	233
Nelson, P. R. ....	677
Neogi, D. ....	1529
Newton, G. H. ....	1865
Ng, K. ....	151
Nigam, S. C. ....	1239
Niiler, A. ....	1581
Nikov, I. ....	1613
Nitsche, L. C. ....	1403
Nouri, J. M. ....	627
Novak, J. P. ....	479
Novak, L. H. ....	1075

## O

Oblad, A. G. ....	1585
Ochs, L. R. ....	1908
O'Hara, P. A. ....	216
Okuyama, K. ....	409

## P

Palazoglu, A. N. ....	66
Panar, M. ....	1933
Papanastasiou, T. C. ....	710
Paris, J. ....	1613
Park, C. W. ....	197
Park, C. Y. ....	1641

Pass, G. ....	1954
Patel, S. A. ....	93, 1731
Payne, R. ....	1865
Pereira, C. J. ....	559
Perrier, M. ....	207
Peters, W. A. ....	1189
Petti, T. ....	1121
Petti, T. F. ....	565
Pfefferle, L. D. ....	861
Pfeifer, H. ....	1500
Pibouleau, L. ....	1349
Pimbley, J. M. ....	547
Pino, L. Z. ....	1758
Pintauro, P. N. ....	1061
Pita, J. ....	397
Polat, S. ....	1370
Pomerleau, Y. ....	207
Poslinski, A. J. ....	1837
Potter, O. E. ....	137
Pranckh, F. R. ....	587
Prasad, R. ....	450, 1592
Prince, M. J. ....	1425, 1485
Pritchett, J. W. ....	361
Puszynski, J. A. ....	1649

## Q

Qiu, Y. ....	665
--------------	-----

## R

Radewonuk, E. R. ....	640
Ramachandran, S. ....	370
Ramakrishnan, T. S. ....	725
Ramberg, K. ....	994
Ramirez, W. F. ....	1046
Randolph, A. D. ....	939
Rangaiah, G. P. ....	1115
Ranzi, E. ....	576
Rao, M. B. ....	1249
Rasmuson, A. C. ....	665
Rasmussen, D. H. ....	871
Rawlings, J. B. ....	623
Rice, R. G. ....	1339, 1421, 1776
Rice, R. W. ....	293, 473, 481
Richey, P. J. ....	641
Richner, D. W. ....	361
Riggs, J. ....	1121
Rikmanis, M. A. ....	1361
Rocheleau, R. E. ....	1555
Rodriguez, C. ....	1263
Rojkowski, Z. ....	630, 1930
Romagnoli, J. A. ....	66
Rossen, W. R. ....	1176
Rota, R. ....	1299, 1736
Rovaglio, M. ....	39, 576

Russell, T. W. .... 1555  
Ruthven, D. M. .... 275, 310

## S

Saez, A. E. .... 1758  
Sandler, S. I. .... 479, 1129  
Sapre, A. V. .... 342, 809  
Sarti, G. C. .... 851  
Saunders, J. H. .... 353  
Saxena, N. .... 1555  
Sayles, R. E. .... 1917  
Schlunder, E. U. .... 151  
Schweich, D. .... 86  
Schyns, P. .... 299  
Scott, T. C. .... 1121  
Scriven, L. E. .... 161, 587  
Seborg, D. E. .... 1391, 1753  
Seidel, R. .... 1500  
Sein, M. .... 469  
Seinfeld, J. H. .... 409  
Selim, S. .... 141  
Sengupta, A. .... 1592  
Serian, A. S. .... 1822  
Shadman, F. .... 307, 1433  
Shah, Y. T. .... 157  
Shaikh, A. A. .... 141  
Shambaugh, R. L. .... 175  
Shaw, J. M. .... 677  
Shen, S. H. .... 1267  
Shenoy, U. V. .... 227  
Shiau, L. D. .... 1669  
Shimizu, K. .... 1815  
Shirakashi, M. .... 1003  
Shoaei, M. .... 943  
Siahpush, A. R. .... 1239  
Sircar, S. .... 1249  
Sirkar, K. K. .... 450, 1592  
Skogestad, S. .... 753, 1121  
Smith, J. M. .... 1768  
Soane, D. S. .... 1931  
Song, G. H. .... 439  
Song, W. .... 1896  
Soria, A. .... 1763  
Sorosh, M. .... 249, 1471  
Sotelo, J. L. .... 1263  
Sparks, B. D. .... 1279  
Spindler, H. .... 1500  
Sridhar, T. .... 137  
Stadtherr, M. A. .... 1687  
Stafford, U. .... 1822

Stallmach, F. .... 1500  
Stangle, G. C. .... 117  
Stateva, R. P. .... 132  
Stein, H. N. .... 321  
Stewart, W. E. .... 655  
Stroh, F. .... 397, 1905  
Struve, P. .... 1500  
Stubington, J. F. .... 75  
Subba Rao, S. .... 29  
Sundaresan, S. .... 605  
Suresh, A. K. .... 137, 431  
Svoboda, J. .... 1121

## T

Tadmor, Z. .... 1313  
Tagashira, K. .... 738  
Talbot, J. B. .... 1145  
Talmon, Y. .... 1313  
Tanimura, S. .... 1118  
Tarbell, J. M. .... 511  
Tatsumi, H. .... 738  
Tavare, N. .... 1929  
Tedder, D. W. .... 943  
Teja, A. S. .... 897  
Thorsness, C. B. .... 801  
Titomanlio, G. .... 13  
Toor, H. L. .... 227  
Tronconi, E. .... 701  
Truelove, J. S. .... 461  
Tsai, G. J. .... 784, 1156  
Tsamopoulos, J. A. .... 1837  
Tsao, G. T. .... 784, 1156  
Tsotsas, E. .... 151  
Tsuo, Y. P. .... 885  
Tsvetkov, S. G. .... 132  
Tweddle, T. A. .... 1279

## U

Uberoi, M. .... 307  
Uebler, E. A. .... 1934  
Ushio, R. .... 409  
Ushkans, E. J. .... 1361  
Uyttendaele, M. A. .... 175

## V

Vanags, J. J. .... 1361  
van Swaaij, W. P. .... 1633  
Varma, A. .... 1032, 1822

Varma, Y. B. .... 29  
Vegeais, J. A. .... 1687  
Verbrugge, M. W. .... 1061, 1097  
Versteeg, G. F. .... 1633  
Viesturs, U. E. .... 1361  
Villermux, J. .... 86  
Vimalchand, P. .... 1851  
Vleeschhouwer, P. H. .... 961  
Von Rosenberg, D. U. .... 598  
Voorhies, N. .... 1259  
Vortmeyer, D. .... 1449

## W

Wahl, P. E. .... 1601  
Wall, T. F. .... 461  
Waller, K. V. .... 1107, 1391  
Wang, H. Y. .... 1239  
Wang, Z. W. .... 955  
Wankat, P. C. .... 1299  
Wasan, D. T. .... 725  
Wasden, F. K. .... 1379  
Watanabe, A. .... 907  
Watson, A. T. .... 1680  
Wei, J. .... 242  
Weinstein, S. J. .... 1873  
White, B. S. .... 685  
White, R. E. .... 187  
Whitelaw, J. H. .... 627  
Wilkes, J. O. .... 710  
Wu, B. C. .... 1129

## Y

Yabu, T. .... 1331  
Yadav, S. K. .... 431  
Yang, D. R. .... 1391  
Yang, R. T. .... 1229  
Yashima, M. .... 1529  
Yeo, S. D. .... 1743  
Yepez, M. M. .... 1758  
Yin, K. M. .... 187  
Yoshida, H. .... 1815  
Yoshimuta, S. .... 1003  
Young, T. C. .... 655  
Yu, C. C. .... 1267  
Yu, Z. Q. .... 955

## Z

Zhao, Y. .... 1433



# SUBJECT INDEX TO VOLUME 36

## A

absorption, 1263, 1331, 1633  
absorption with reaction, 141  
acetone-methanol separation, 969  
acidic oils, 233  
active sites, multiple, 837  
activity, 370, 1908  
activity coefficient, 479, 1896  
adaptive systems, 1075  
additives, 1145  
adiabatic columns, 1299  
adsorbed solution theory, 1736  
adsorbents, 307  
adsorbents, gel-enclosed, 1239  
adsorber, 1003  
adsorption, 53, 147, 302, 725, 789,  
907, 1299, 1430, 1605, 1815  
adsorption equilibrium, 1715, 1736  
aerosol evolution, 409  
aggregation, 106, 1748  
air entrainment, 1283  
alkali, 725  
alkylsilylation, 1118  
AlN films, 871  
amine, 1633, 1815  
amino acid, 333, 1220  
ammonia, 794  
amorphous polymer, 420  
amorphous silicon, 1555  
anomalous diffusion, 851, 877  
antibiotic, 333  
aqueous solution, 539, 1743  
aqueous systems, 1017  
artificial intelligence, 1121  
autocatalytic reactions, 342  
azeotropic distillation, 969

## B

backfill cycle, 53  
baker's yeast, 207  
balancing, 1321  
batch automation, 1822  
batch crystallization, 665, 1669  
batch distillation, 1349  
batch reactor, 293, 1768  
bed support factor, 461

benzylphenylether, 1129  
bidisperse sorbent, 789  
bifurcation, 342, 641, 1905  
biofilm electrode, 19  
biofilm sensor, 19  
bioprocesses, 207  
bioproduct separation, 1239  
bioreactor, 547, 1361  
biotechnology, 1933  
biporous adsorbent, 302  
bitumen, 1279  
blade coating, 587  
blow molding, 1837  
blown film, 420  
boundary layer, 1917  
branched pipelines, 805  
breakthrough, 1430  
break-up, 1485  
Brownian coagulation, 409  
bubble, 439, 1425  
bubble breaker, 1255  
bubble coalescence, 1485  
bubble coalescence/dispersion, 1763  
bubble column, 93, 1255, 1421,  
1485, 1731, 1758, 1776  
bubble column reactor, 216  
bubble column, viscous, 1339  
bubble growth, 1313  
bubble length distribution, 1763  
bubble wake model, 1613  
bubbling, 361

## C

calcium hydroxide, 473  
capacity factor, 1715  
capillary electrophoresis, 916  
capillary rheometry, 13  
carbon dioxide, 299, 1263, 1633,  
1768  
carbon dioxide diffusion, 469  
carbon monoxide, 1433  
carotene, beta-, 939  
cascade control, 1267  
Catalan numbers, 1601  
catalysis, 137, 157, 773, 794, 1796  
catalyst, 746, 779  
catalyst evaluation, 685

catalyst particle, 151  
catalyst, porous, 559  
catalytic cracking, 1617  
caustic reagents, 233  
cellulose acetate membranes, 1610  
ceramics, 481, 1032, 1581  
chaos, 641  
characteristics, method of, 1229  
charged drops, 1039  
chemical reaction kinetics, 1200  
chemical vapor deposition, 409  
chemical vapor infiltration, 481  
chlorogallate, 1097  
chromatography, 86, 147, 265, 784,  
1156, 1163, 1569, 1722, 1933  
chromatography, annular, 1220  
chromatography, liquid, 275  
circulating fluidized bed, 885, 1003  
circulation, 1776  
clathrate hydrates, 1931  
cluster, 885  
clustering, 1920, 1927  
CO oxidation, 1796  
CO<sub>2</sub> absorption, 939  
coal, 75  
coal pyrolysis, 1189  
coalescence, 1425, 1485, 1763  
coating, 161, 1283  
coating flow, 587, 1873  
cobalt catalyst, 137  
coextrusion, 197  
coherence function, 955  
collocation, 655  
combustion, 75, 1707  
combustion synthesis, 1649  
combustion waves, 1032  
combustion, catalytic, 861  
combustion, solid, 1581  
complex reaction mixtures, 685  
composite materials, 927  
compression zone, 3, 633  
computational hydrodynamics, 885  
conductivity, 387  
configuration, 753  
contact nucleation, 1669  
continuous chromatography, 1220  
continuous cylinder, 1917  
control, 1349, 1779

control structures, 1107  
 control, cascade, 1267  
 control, distillation, 1121, 1391  
 control, feedforward, 576, 1471  
 control, generic model, 283  
 control, model predictive, 1115  
 control, nonlinear, 66, 249, 1753  
 control, PID, 1891  
 controlled release, 431  
 countercurrent separation, 310  
 critical behavior, 539, 1901  
 critical flow, 797  
 critical points, 1920, 1927  
 critical properties, 897  
 cross-flow, 655, 1649  
 crude oil, 725  
 crystal growth, 106, 665, 1536, 1748  
 crystal size distribution, 630  
 crystallization, 511, 665, 939, 1929  
 crystallization modeling, 630  
 crystallization, batch, 1669  
 crystallization, flow-induced, 13  
 CSTR, 961  
 Cu(I)-NaY zeolite, 789  
 cumene, 1577  
 CVD, 801, 1555  
 cyclohexane, 137

## D

data reconciliation, 985  
 deactivation, 779  
 dead time, 1025  
 deadtime compensation, 1075  
 dechlorination, 773  
 decoupling, 1107, 1753  
 deep knowledge, 565, 1121  
 density profiles, 287  
 design, 943  
 design, thickener, 1545  
 desulfurization, 473  
 detector, 19  
 detonation, 1087  
 devolatilization, 75, 1313  
 dextran, 275, 1017  
 dielectric constant, 1061  
 diesel engines, 353  
 differential sorption, 877  
 diffusion, 302, 342, 387, 469, 779, 1011, 1430, 1577  
 diffusion kinetics, 1785  
 diffusion, anomalous, 851, 877  
 diffusion, liquid, 1569  
 diffusion, restricted, 242, 559  
 diffusion, surface, 1249  
 diffusivity, effective, 1715

digesters, 1075  
 digital control, 1115  
 digital imaging, 1785  
 dilatancy, 321  
 dilute mixtures, 897, 1901  
 direct-contact heat transfer, 1137  
 dispersion, 86, 598, 827, 916  
 dispersion coefficient, 1731  
 dispersions, 321  
 displacement, 1156  
 displacement, crude oil, 725  
 displacement development, 1220  
 dissolution, 665  
 distillation, 39, 576, 655, 943, 1275, 1916  
 distillation control, 753, 1107, 1121, 1391  
 distillation, azeotropic, 969  
 distribution coefficient, 275, 1743  
 disturbance predictor, 1025  
 disturbance rejection, 1107  
 drainage, 287  
 drop formation, 1272  
 drop size, 677  
 drops, charged, 1039  
 dry scrubbing, 473  
 drying, fluidized, 29  
 dual-mode theory, 1505  
 dumbbell polymer model, 1403  
 dust explosion, 1087  
 dynamic structural transformation, 1391  
 dynamics, 39, 576, 961

## E

Eddy dispersion, 1421  
 effective diffusivity, 86, 302  
 effective property, 927  
 effectiveness factor, 151, 779  
 efficiency, 1916  
 elastohydrodynamics, 587  
 electrochemistry, 387  
 electrodeposition, 187  
 electrodeposition painting, 1815  
 electrohydrodynamics, 1039  
 electrokinetic, 1061  
 electrolyte, 370, 479, 640, 1425, 1896  
 electron energy distribution, 1439  
 electroosmosis, 916  
 electrophoresis, 916  
 electroplating, 1145  
 emulsion polymerization, 623  
 encapsulated adsorbent, 1239  
 encapsulation, 431

energy conservation, 969  
 energy minimization, 1275  
 entrainment, 1283  
 entrapment, 1641  
 entry angle, 1283  
 enzyme, 299  
 equation of state, 132, 1625, 1829, 1851, 1920, 1927  
 equation-solving, 641  
 equilibrium, adsorption, 1736  
 error detection, 1589  
 error reconciliation, 1321  
 error-in-variables method, 985  
 estimation, 207  
 ethane, 299, 861  
 ethanol aqueous solution, 1118  
 ethanol-water separation, 969  
 ethylene, 789  
 excess Gibbs energy, 1829  
 exhaust gases, 353  
 expert systems, 565  
 explosions, 1087  
 extensional flow, 197  
 external film, 1430  
 extractables, 1189  
 extraction, 1039, 1592

## F

fast reactions, 1773  
 fault detection, 1697  
 fault diagnosis, 565, 1121  
 fed-batch bioreactor, 207  
 feedback control, 1115  
 feedback, derivative, 283  
 feedforward control, 576, 1267, 1471  
 ferric sulfate, 1331  
 ferritin, 1121  
 fiber formation, 1917  
 fiber spinning, 175, 197  
 filament shape, 738  
 film blowing, 420  
 film processing, 1873  
 film theory in gas absorption, 141  
 film, wavy, 1379  
 films, polymer, 1931  
 filtering, 1321  
 filters, 353  
 filtration combustion, 1649  
 fine chemicals, 1822  
 finite element method, 161, 1837  
 Fischer-Tropsch synthesis, 93, 1731  
 flashing flow, 797  
 flat sheet permeator, 1610  
 Flory-Huggins, 1017, 1505  
 flow instabilities, 161

flow regime, 955, 1763  
 flowsheeting, 291, 1687  
 flue gas, 307, 473  
 fluidization, 361, 523, 955  
 fluidization, three-phase, 1613  
 fluidized bed, 75, 439, 1529  
 fluidized drying, 29  
 fluidized bed, circulating, 885, 1003  
 foam, 117, 287, 1313  
 foam generation, 1176  
 foaming, 1758  
 forced composition cycling, 1796  
 formaldehyde, 1807  
 fractal, 1529  
 fractional Brownian motion, 1529  
 fractional-order reaction, 151  
 fractionation, 655  
 freezing, 640  
 frontal method, 1687

## G

gallium arsenide, 1097  
 galvanostatic, 187  
 gamma rays, 827  
 gas absorption, 141, 1331  
 gas agitation, 677  
 gas antisolvent, 939  
 gas disengagement, 93  
 gas evolution, 1768  
 gas hold-up, 1731  
 gas hydrates, 1931  
 gas mixtures, 1229  
 gas-liquid flow, 805, 818, 1339  
 gas-liquid interface, 957  
 gas-liquid mass transfer, 439  
 gas-liquid reaction, 1865  
 gas-liquid reactor, 137  
 gas-solid flow, 361, 955  
 gas-solids transport, 885  
 gas-treating, 1633  
 gas-water, 265  
 gel layer, 907  
 gel, microporous, 1605  
 generating function, 1601  
 generic model control, 283  
 glucose synthesis, 1822  
 granular materials, 242  
 gravity jet, 738  
 gross errors, 1589  
 group contribution, 1625, 1829  
 growth rate dispersion, 1669

## H

Harkins-Brown factor, 1272  
 hazardous waste, 1707  
 heat effects in gas absorption, 141  
 heat exchanger, 397  
 heat transfer, 598, 765, 1039  
 heat transfer, impingement, 1370  
 Henry's constant, 539, 1901  
 high pressure, 1829  
 high temperature, 539, 1597  
 hindered diffusion, 242  
 holdup, 576, 1613  
 hollow fiber, 547  
 homogeneous nucleation, 1536  
 hot pressing, 481  
 hydrates, 1931  
 hydrosulfurization, 746  
 hydrogel, 994  
 hydrogen bonding, 1851  
 hydrogen plasma, 1439  
 hydrogen sulfide, 1331  
 hydrogen/tetralin mixtures, 1597  
 hydrogenation, 746  
 hydroprocessing, 773  
 hysteresis, 1641

## I

ice slurry, 640  
 identification, 1046  
 ignition, 861  
 ilmenite, 1433  
 imaging, 547  
 impingement heat transfer, 1370  
 impinging jets, 1370  
 incineration, 307, 1707  
 industrial chemistry, 157  
 information science, 1934  
 input-output linearization, 249, 1753  
 instability, 353  
 instrumentation, 1916  
 intensification, 1299  
 intensity of segregation, 227  
 interfacial polycondensation, 431  
 interfacial tension, 233  
 interference, 1156  
 intermittent flow, 701  
 invariant, distillation, 1391  
 inventory control, 1391  
 ion exchange, 387, 1061, 1220, 1815  
 ionic hydration, 1061  
 isomeric separations, 1163  
 isopiestic, 1908  
 isotopically enriched sugars, 1822

## J

jet impingement, 801  
 jet, laminar, 738  
 jet, plane, 818

## K

K-factor, 1901  
 Kalman filter, 1697  
 kinetic lumping, 685  
 kinetic modeling, 1200, 1617  
 kinetic selectivity, 1239  
 kinetic theory model, 523  
 kinetics, 773, 1129, 1457, 1585  
 kinetics, solid-gas, 1433  
 kinetics/catalysis, 685  
 Kynch theory, 1545

## L

laminar boundary layer, 1917  
 laser-Doppler anemometry, 627  
 lattice fluid, 1625  
 lead removal, 307  
 Lewis acid/base, 1851  
 likelihood ratios, 1589  
 lime, 1865  
 linear programming, 1707  
 linear stability analysis, 710  
 linearizing transformations, 66  
 lipase, 299  
 liquid chromatography, 275  
 liquid circulation, 1339, 1776  
 liquid coating, 1283  
 liquid membranes, 1259  
 liquid-solid, 1444  
 liquid-solid fluidized bed, 439  
 lithography, 1046  
 local composition model, 370  
 low-temperature deposition, 871  
 lumping, 685

## M

macromolecular transport, 1403  
 magnetic field, 1121  
 magnetic resonance, 287  
 magnetic resonance imaging, 1680  
 maldistribution, 127, 151  
 mass exchange, 1209  
 mass transfer, 53, 265, 801, 957,  
 994, 1011, 1255, 1379, 1444,  
 1500, 1768  
 mass transfer enhancement, 1259  
 mass transfer with reaction, 117

mathematical models, 1075  
 maximum power, 1589  
 measurement error, 1321  
 measurement test, 1589  
 mechanically agitated, 677  
 melt blowing, 175  
 membrane, 450, 1118, 1592  
 membrane capsule, 1239  
 membrane separation, 1279, 1610  
 membrane, ion-exchange, 1061  
 mercury porosimeter, 1641  
 mercury sensitized photo-CVD, 1555  
 metal oxide particles, 409  
 methane, 861  
 methane separation, 1229  
 methanol, 1054, 1807  
 microcomputer control, 1822  
 microelectrode, 1097  
 microencapsulation, 431  
 micromixing, 293  
 microorganisms, 1361  
 microporous gel, 1605  
 migration, 1097  
 mixing, 75, 227, 293, 627, 1361, 1773  
 mixing rule, 948, 1743  
 mixing with reaction, 1457  
 mixing, nonideal, 951  
 mixture, 948, 1661  
 mixtures, activities, 1908  
 mobilization, 1176  
 model-predictive control, 1115  
 model-based reasoning, 565  
 modeling, 623, 809, 1349  
 molecular dynamics, 948  
 molecular resolution, 1163  
 molecular weight distribution, 1189  
 monolith, 746  
 moving boundary method, 1421  
 moving boundary problem, 1837  
 moving heat transfer surface, 1370  
 moving bed, 809  
 MSMR crystallizer, 630, 1929  
 multicomponent, 233, 784, 1908  
 multicomponent chromatography, 1156  
 multilayer extrusion, 710  
 multilayered films, 1873  
 multiphase flow, 1087, 1137, 1680  
 multiple solutions, 641  
 multiple steady states, 39, 1905  
 multiplicity, 342, 951  
 multiplicity maps, 397  
 multiprocessing, 291  
 multistep reactions, 1200

multitasking, 291  
 multivariable control, 249, 1471

## N

nanoclusters, 871  
 naphthalene sublimation, 801  
 natural gas, 1931  
 network reduction, 1200  
 networks, 943  
 nickel ammonium sulfate, 106  
 nickel-chrome alloy, 187  
 nitric oxide, 794  
 nitrides, 1649  
 NMR, 287, 547, 559, 1500, 1680  
 non-Boolean reasoning, 565  
 non-Fickian diffusion, 877  
 nonideal mixing, 951  
 nonuniform flow, 86  
 nonadiabatic reactor, 1905  
 nondispersive membrane extraction, 450  
 nonionic surfactant, 1785  
 nonlinear analysis, 605  
 nonlinear chromatography, 1569  
 nonlinear control, 66, 249, 1471, 1753  
 nonlinear programming, 1349  
 nonlinearity, measures of, 985  
 nonthermal plasma, 1439  
 nonwoven, 175  
 nuclear magnetic resonance, 287, 547, 559, 1500, 1680  
 nucleation, 106, 511, 1289, 1536, 1669, 1748, 1929  
 numerical analysis, 784  
 numerical simulation, 1649  
 numerical solution, 1379

## O

octane number, 1617  
 oil shale, 809  
 Oldroyd-B model, 710  
 on-line tuning, 1891  
 optical fiber reagents, 216  
 optimization, 1707, 1822  
 organic mixtures, 1743  
 oscillatory flow, 1259  
 osmotic pressure, 370, 907  
 ovalbumin, 907  
 oxidation, 137  
 oxidative catalysis, 861  
 oxygen transport, 19

## P

packed bed, 127, 147, 461  
 packed tubes, 151  
 pair interactions, 927  
 parallel cascade control, 1267  
 parallelism, 291  
 parameter estimation, 985, 1046  
 partial molar volume, 1715  
 particle diffusion, 1430  
 particle formation, 1289  
 particle growth, 511  
 particle size distribution, 147, 623, 1569  
 particulate Stokes flow, 1403  
 partitioning, 1605  
 patents, 1933  
 pendant drop, 1785  
 Peng-Robinson EOS, 939  
 percolation, 1176, 1641  
 periodic processing, 1796  
 periodic waves, 605  
 permeabilities in mixtures, 1610  
 petroleum recovery, 725  
 phase behavior, 1129  
 phase equilibria, 1597, 1807, 1851  
 phase-change phenomena, 1137  
 phenol, 450  
 photochlorination, 216  
 photoresist, 1046  
 PID control, 1891  
 pillared titanium phosphate, 794  
 pipeline mixing, 1773  
 plasma, 1439  
 plasma deposition, 871  
 platelet deposition, 994  
 plating, pulse, 187  
 poly(1-trimethylsilyl-1-propyne), 1118  
 polyether polysiloxane networks, 994  
 polyethylene, 13, 837  
 polyethylene glycol, 1908  
 polyethylene oxide hydrogel, 994  
 polymer films, 1931  
 polymer foams, 1313  
 polymer processing, 13, 175, 397, 1837  
 polymer solution thermodynamics, 1625  
 polymer spheres, 1011  
 polymer, nonionic, 1517  
 polymerization, 623  
 polymerization control, 249  
 polymerization, gas-phase, 837  
 polymers, 1505  
 polymers, diffusion in, 877



polypropylene, 175  
 population balance, 106, 630, 1137,  
 1748, 1929  
 pore, 1592  
 porous media, 86, 827, 1176, 1249,  
 1403, 1641, 1680  
 powder, 481  
 power consumption, 1361  
 precipitation, 511, 1536  
 precipitation, protein, 1517  
 preparative chromatography, 1722  
 pressure drop, 151  
 pressure fluctuations, 1529  
 pressure swing adsorption, 53, 310,  
 1229, 1299  
 probability density function, 227  
 process control, 1025, 1075, 1753,  
 1779  
 process simulation, 132, 641  
 protein partitioning, 1017  
 protein precipitation, 1517  
 protein separation, 1722  
 PSA, 53, 310  
 pulsing flow, 605  
 pyrolysis, 1129, 1189, 1585

## R

raceway, 461  
 radial heat flux, 598  
 rapid expansion, 1289  
 reacting system, 961  
 reaction kinetics, 1331, 1439  
 reaction, solid-solid, 1032  
 reactor, 779, 1054  
 reactor engineering, 1054  
 reactor modeling, 1555  
 reactor, batch, 293  
 reactor, fluidized, 361  
 reactor, polymerization, 837, 1471  
 reactor, stirred tank, 961  
 reactor, three-phase, 117  
 reactor, tubular, 1905  
 reboiler, 765  
 Redlich-Kwong Equation, 897  
 reduction reaction, 1433  
 regeneration, 2305  
 regeneration, filter, 353  
 relative gain array, 753  
 residence time distribution, 29, 127  
 restricted diffusion, 242, 559  
 retorting, 809  
 retrograde effect, 1163  
 reverse osmosis, 1118  
 Reynolds stress, 1339  
 RF plasma deposition, 871

rheology, 13, 321, 420  
 robustness, 1025  
 roll coating, 161  
 rotating disk electrode, 187  
 route selectivity, 805  
 runaway reaction, 1697

## S

safety, 1697  
 salt, molten, 1097  
 saturation, 1680, 1736  
 Sauter bubble diameter, 93  
 scaleup, 293  
 scaling law, 797  
 scaling rules, 1299  
 scanning electron microscopy, 1313  
 scattering, 827  
 Schmidt number, 265  
 scrubber, 1865  
 seawater, 1003  
 second-order chemical reactions,  
 1457  
 secondary measurement, 1267  
 sector bounds, 66  
 sedimentation, 3, 633, 1545, 1779  
 sedimentation-dispersion model,  
 1758  
 segregation, intensity of, 227  
 self-propagating reaction, 1032,  
 1581  
 separation, 157, 943, 1121, 1722,  
 1779, 1933  
 separation processes, 310, 1259  
 separation sequence, 1601  
 separation, kinetic, 1229  
 separation, membrane, 1610  
 sharp split separators, 1601  
 shear thickening, 321  
 shear-thinning liquids, 710  
 silane, trichloro-, 216  
 silica gel, 275, 1605  
 silicon, amorphous, 1555  
 simulation, 132, 361  
 singularity method, 1403  
 sintering, 481  
 size distribution, 1137  
 slug flow, 701  
 slurry, 117, 1865  
 Smith predictor, 1025  
 solid combustion, 1581  
 solid distribution, 1758  
 solid-liquid, 1779  
 solid-solid reactions, 1032  
 solidification, 1837  
 solids viscosity, 523

solubility, 333, 1517, 1901  
 solute aggregation model, 479  
 solution thermodynamics, 1625  
 solvent extraction, 450, 1279, 1592  
 solvent removal, 1011  
 sorbent, 147, 307  
 sorption, 851, 1505, 1569  
 sparger, air, 1485  
 sparingly soluble salts, 1536  
 sparse matrices, 1687  
 spectroscopy, 1931  
 spheroids, 927  
 stability, 66, 161, 605, 961, 1873  
 state estimation, 1046  
 statistical adsorption model, 1736  
 statistical mechanics, 1517  
 statistical model, 1457  
 steady-state multiplicity, 951  
 stirred tanks, 1768  
 stochastic process, 1529  
 stress distribution, 461  
 structure transformations, 1107  
 structured singular value, 753  
 sublimation, 801  
 succinic acid, 665  
 sulfur dioxide, 473, 1865  
 supercomputer, 291, 1687  
 supercritical extraction, 1715, 1743,  
 1920, 1927  
 supercritical fluid, 299, 1129, 1163,  
 1289  
 supported liquid membranes, 1259  
 supported platinum catalyst, 1796  
 surface diffusion, 1249  
 surfactant adsorption, 1785  
 suspensions, 321, 387  
 synthesis, 943, 1054, 1822

## T

t-junction, 805  
 tar, 1189  
 tar sands, 1585  
 Taylor dispersion, 598, 1421  
 tee mixer, 1773  
 thermal conductivity, 927  
 thermodynamics, 539, 1505, 1597,  
 1661, 1851, 1896, 1920, 1927  
 thermoflow multiplicity, 397  
 thickener, 3, 633, 1545  
 Thiele modulus, 342, 1145  
 thin films, 1931  
 thiophene, 746  
 three-phase slurry bubble column,  
 1731

three-phase fluidization, 439, 1613, 1763  
through-hole, 1145  
throughflow, 1370  
toxic chemicals, 19  
tracer methods, 127  
transient systems, 1321  
tray efficiency, 655  
trickle bed, 127, 605, 1054, 1444  
triethanolamine, 1263  
trioxane, 1807  
tube bundle, horizontal, 765  
tube-to-particle diameter ratio, 151  
tubular reactor, 1905  
tuff saturation, 469  
turbulence, 227, 265, 598, 627, 818, 955, 957, 1361, 1421  
turbulent mixing, 511, 1457  
two-phase fiber, 197  
two-phase flow, 523, 701, 765, 797, 805, 818, 1339, 1444, 1916  
two-point control, 753

## U

ultrafiltration, 907, 1279  
ultrafine particle production, 409  
underexpanded jet, 818  
UNIFAC, 333  
uniformity, 1145  
unit operations, 157  
upgrading, 1279  
uranium recovery, 1003

## V

vanadia, 794  
vapor-liquid equilibrium, 1807, 1829  
vector processing, 1687  
vertical jets, 738  
virial coefficients, 1661  
viscoelastic liquids, 710  
viscoelastic relaxation, 851  
viscoplastic, 420  
viscosity, 948

viscosity, solids, 523  
viscous liquids, 1255  
void fraction, 765  
volcanic rock, 469

## W

wall friction, 151  
wastewater treatment, 1815  
wave equation, 1722  
wave propagation, 1873  
waves, 1379  
wax, 93  
wetting efficiency, 1444

## Z

zeolite, 789, 1500  
zeolite, modified H-ZSM-8, 1577  
Ziegler-Natta, 837  
zone-spreading, 916  
ZSM-8, 1577

# TITLE INDEX TO VOLUME 36

## A

- Absorption of Carbon Dioxide into Aqueous Solutions of Triethanolamine ..... 1263
- Activity Coefficient Model of Concentrated Electrolyte Solutions ..... 1896
- Adaptive-Predictive Control of Kamyr Digester Chip Level ..... 1075
- Adsorption of Amine and Paints of H-Form Resin from Electrodeposition Wastewater ..... 1815
- Adsorption Equilibria of Nonideal Multicomponent Systems at Saturation ..... 1736
- Adsorption Uptake Curves of Ethylene on Cu(I)—NaY Zeolite ..... 789
- Analysis of Autocatalytic Reactions in Isothermal Catalyst Particles ..... 342
- Analysis of Bioproduct Separation Using Gel-Enclosed Adsorbents ..... 1239
- Analysis of Liquid Chromatography with Nonuniform Crystallite Particles ..... 1569
- Analytic Solution for Chromatography with Nonuniform Sorbent Particles ..... 147
- Analytical Solutions of Emulsion Polymerization Models ..... 623
- Application of the Group Contribution Lattice-Fluid EOS to Polymer Solutions ..... 1625
- Approach to Organizing the EOS Model in Process Simulators, An ..... 132
- Approximate Solution for the Viscous Boundary Layer on a Continuous Cylinder ..... 1917
- Axial Dispersion for Turbulent Flow with a Large Radial Heat Flux ..... 598

## B

- Backfill Cycle of the Pressure Swing Adsorption Process, The ..... 53
- Benzylphenylether Thermolysis Mechanism: Insights from Phase Behavior ..... 1129
- Book Reviews ..... 157, 639, 1456, 1779, 1931
- Bouncing Motions of Liquid Drops between Tilted Parallel-Plate Electrodes ..... 1039
- Bubble Coalescence and Break-Up in Air-Sparged Bubble Columns ..... 1485
- Bubble-Size Distributions in Fischer-Tropsch-Derived Waxes in a Bubble Column ..... 93
- Bubbling Fluidization Model Using Kinetic Theory of Granular Flow ..... 523

## C

- Calculation of the Compression Zone Height in Continuous Thickeners ..... 3
- Capillary Experiments of Flow-Induced Crystallization of HDPE ..... 13
- Catalytic Hydroprocessing of Chlorobenzene and 1,2-Dichlorobenzene ..... 773
- Catalyzed Oxidation of Cyclohexane in the Liquid Phase ..... 137
- Ceramic Processing, An Overview (Journal Review) ..... 481
- Chromatography Theory: Application to Supercritical Fluid Extraction ..... 1715
- CO Oxidation on Pt: Variable Phasing of Inputs During Forced Composition Cycling ..... 1796

- Collocation Analysis of a Boundary-Layer Model for Crossflow Fractionation Trays ..... 655
- Combinatorial Aspects of Sharp Split Separation Systems Synthesis ..... 1601
- Competitive Hydrodesulfurization and Hydrogenation in a Monolithic Reactor ..... 746
- Computation of Flow Patterns in Circulating Fluidized Beds ..... 885
- Computer Simulation of Isothermal Fluidization in Large-Scale Laboratory Rigs ..... 361
- Conical Moving-Bed Shale Retort Model ..... 809
- Consequence of Flow Nonuniformity on the Measurement of Effective Diffusivity ..... 86
- Continuous Countercurrent Flow Model for a Bulk PSA Separation Process ..... 310
- Control Structures for Disturbance Rejection and Decoupling of Distillation ..... 1107
- Control of TiB<sub>2</sub> SHS Reactions by Inert Dilutions and Mechanical Constraint ..... 1581
- Correlation of Aqueous Henry's Constants from 0°C to the Critical Point ..... 539
- Correlation of Nonverticality and Entrance Effects in Bubble Columns ..... 1421
- Critical Properties of Dilute Multicomponent Mixtures ..... 897

## D

- Detection of Flow Maldistribution in Packed-Beds via Tracers ..... 127

Determination of Flow Profiles in Porous Media Using Shifts in Gamma Spectra ...	827
Development of Circulating Fluidized Bed Absorber.....	1003
Development and Use of a Space-Charge Transport Model for Ion-Exchange Membranes.....	1061
Diagnostic Model Processor: Using Deep Knowledge for Process Fault Diagnosis.....	565
Diffusion of Cumene in H-ZSM-8 and Modified H-ZSM-8 Zeolites.....	1577
Diffusion from Spheres in a Continuous-Flow Stirred Tank.....	1011
Diffusion-Controlled Surfactant Adsorption Studied by Pendant Drop Digitization.....	1785
Discretized Population Balance for Continuous Systems at Steady State, A.....	106
Displacement Effect in Multi-component Chromatography.....	1156
Displacement Separations by Continuous Annular Chromatography.....	1220
Dynamic Model for the Interaction of Caustic Reagents with Acidic Oils, A.....	233
Dynamic Structural Transformations for Distillation Control Configurations.....	1391
Dynamics of Heterogeneous Azeotropic Distillation Columns.....	39
Dynamics of Pulsing Flow in Trickle Beds.....	605

## E

Effect of Adsorption on the Optimal Displacement of Acidic Crude Oil by Alkali.....	725
Effect of Mixing on the Precipitation of Barium Sulfate in a MSMPR Reactor.....	511
Effect of Pressure on an Enzymatic Reaction in a Supercritical Fluid.....	299

Effect of Substrate Entry Angle on Air Entrainment in Liquid Coating.....	1283
Effective Kinetic Modeling of Multistep Homogeneous Reactions.....	1200
Effective Thermal Conductivity of Composites Containing Spheroidal Inclusions...	927
Effects of Osmotic Pressure and Adsorption on Ultrafiltration of Ovalbumin.....	907
Efficient Implementation of Simplified Model Predictive Control.....	1115
Elastohydrodynamics of Blade Coating.....	587
Electrokinetic Dispersion in Capillary Electrophoresis...	916
Energy Requirements of Non-conventional Distillation Systems.....	1275
Enhanced Robustness of Generic Model Control Using Derivative Feedback.....	283
Errata.....	468, 640, 778, 1451, 1609, 1776, 1925
Estimation of Multiple Specific Growth Rates in Bioprocesses.....	207
Estimation of Surface Diffusion through Porous Media.....	1249
Ethanol-Selective Membrane for Reverse Osmosis of Ethanol/Water Mixture.....	1118
Evolution of Bubble Length Distributions in Three-Phase Fluidized Beds.....	1763
Experimental Study and Parametrization of Interfacial Gas Absorption.....	265
Experiments on the Conductivity of Suspensions of Ionically-Conductive Spheres..	387
Exploiting Parallelism in Chemical Engineering Computations.....	291
Extensional Flow of a Two-Phase Fiber.....	197
External Film and Particle Phase Control of Adsorber Breakthrough Behavior.....	1430

## F

Feedforward/Feedback Control of Multivariable Non-linear Processes.....	1471
Flow Apparatus for Phase Equilibrium Measurement at Elevated Temperatures ..	1597
Flow Characteristics of a Small-Hole Sieve Tray.....	1913
Flow Characteristics of Stirred Reactors with Newtonian and Non-Newtonian Fluids.....	627
Flue Gas Desulfurization by In-Duct Dry Scrubbing Using Calcium Hydroxide.....	473
Fluid Dynamics of Reverse Roll Coating, The.....	161
Fluidized Bed Drying of Solids.....	29

## G

Gas Holdup and Solids Dispersion in a Three-Phase Slurry Bubble Column.....	1731
Gas Phase and Catalytic Ignition of Methane and Ethane in Air over Platinum.....	861
Gas-Liquid Mass Transfer from a Single Bubble in Liquid-Solid Fluidized Beds.	439
Gas-Liquid Mass Transfer in Stirred Tanks.....	1768
Growth and Dissolution of Succinic Acid Crystals in a Batch Stirred Crystallizer ..	665
Growth Rate Dispersion in Batch Crystallization.....	1669

## H

Harkins-Brown Correction Factor for Drop Formation.....	1272
Heat Transfer and Population Characteristics of Dispersed Evaporating Droplets .....	1137
Heat Transfer under Multiple Slot Jets Impinging on a Permeable Moving Surface .....	1370
High-Pressure Vapor-Liquid Equilibrium with a UNI-	



FAC-Based Equation of State.....	1829
Homogeneous Nucleation in Supercritical Fluids.....	1289
Hydrodynamics of Gas-Agitated Liquid-Liquid Dispersions.....	677
Hydrodynamics of Particle Motion in Sinusoidal Pores via a Singularity Method....	1403
Hydrodynamics of a Semi-batch Slurry Bubble Column with a Foaming Liquid.....	1758

## I

Improved Isopiestic Method to Determine Activities in Multicomponent Mixtures, An.....	1908
Improved Technique for PID Controller Tuning from Closed-Loop Tests, An.....	1891
Influence of Finite Jets on Mass Transfer in Radial-Flow, Multijet CVD Reactors.....	801
Influence of Molecular Shape on Probing Mass Transfer Resistances on Zeolites.....	1500
Initial Condition for Population Balance in an MSMR Crystallizer.....	630
Input-Output Linearization of General Nonlinear Processes.....	1753
Intensification of Pressure Swing Adsorption Processes.....	1299
Interpretation of the Magnetic Resonance Imaging Signal from a Foam.....	287

## K

Kinetic Model for Industrial Gas-Phase Ethylene Copolymerization, A.....	837
Kinetic Separation by Pressure Swing Adsorption: Method of Characteristics Model.....	1229
Kinetics of Absorption of Hydrogen Sulfide into Aqueous Ferric Sulfate Solutions.....	1331

Kinetics of Carbon Dioxide with Tertiary Amines in Aqueous Solution.....	1633
Kinetics and Mechanism of Ilmenite Reduction with Carbon Monoxide.....	1433
Kinetics of Nucleation from Aqueous Solution.....	1536
Kinetics of Tar Sand Pyrolysis Using a Distribution of Activation Energy Model...	1585

## L

Letters to the Editor..	151, 479, 633, 1121, 1453, 1927
Limiting vs. Apparent Critical Behavior of Henry's Constants and $K$ Factors ....	1901
Lumped Kinetics of Many Parallel $n$ th-Order Reactions .....	685

## M

Magnetic Resonance Imaging and Modeling of Flow in Hollow-Fiber Bioreactors...	547
Mass Transfer with Chemical Reaction in a Three-Phase Foam-Slurry Reactor .....	117
Mass Transfer in Continuous Bubble Columns with Floating Bubble Breakers .....	1255
Mass Transfer into a Turbulent Liquid across the Zero-Shear Gas-Liquid Interface.....	957
Mass Transport with Relaxation in Polymers.....	851
Mathematical Model of Pulse Plating on a Rotating Disk Electrode, A.....	187
Maximum Power Tests for Gross Error Detection Using Likelihood Ratios .....	1589
Mean Field Calculations of Thermodynamic Properties of Supercritical Fluids.....	1920
Measurement of Transport Enhancement in Oscillatory Liquid Membranes.....	1259
Mechanism of Flow Regime Transition from Bubbling to Turbulent Fluidization...	955

Melt Blowing: General Equation Development and Experimental Verification.....	175
Mercury-Sensitized Photochemical Vapor Deposition of Amorphous Silicon.....	1555
Methanol Synthesis in a Trickle-Bed Reactor .....	1054
Microcomputer-Automated Reactor for Synthesis of $^{13}\text{C}$ -Labeled Monosaccharides .....	1822
Microelectrode Study of Gallium Deposition from Chlorogallate Melts.....	1097
Microencapsulation in Polyurea Shell by Interfacial Polycondensation.....	431
Model for Volatiles Release into a Bubbling Fluidized-Bed Combustor, A.....	75
Modeling of Additive Effects on the Electroplating of a Through-Hole.....	1145
Modeling the $\text{SO}_2$ -Slurry Droplet Reaction .....	1865
Modified Smith Predictor with an Approximate Inverse of Dead-Time, A.....	1025
Multiple Filter Methods for Detection of Hazardous States in an Industrial Plant.....	1697

## N

Near-Critical Phenomena and Resolution in Supercritical Fluid Chromatography.....	1163
New Approach to a General Nonlinear Multicomponent Chromatography Model....	784
New Hypotheses for Mercury Porosimetry with Percolation Approach.....	1641
NMR Imaging of Saturation during Immiscible Displacements .....	1680
Nondispersive Membrane Solvent Back Extraction of Phenol.....	450
Nonisothermal Gas Absorption Accompanied by a Second-Order Irreversible Reaction .....	141
Nonisothermal Parison Inflation in Blow Molding .....	1837

Novel Liquid-in-Pore Configurations in Membrane Solvent Extraction .....	1592
Nucleation, Growth, and Aggregation Rates from Steady-State Experimental Data .....	1748
Number of Steady States of the Nonadiabatic Tubular Reactor, On the .....	1905
Numerical Study of Mass Transfer in Free Falling Wavy Films .....	1379

## O

On-Line State and Parameter Identification of Positive Photoresist Development....	1046
Optimization of Multiple-Fraction Batch Distillation by Nonlinear Programming.	1349
Optimizing the Throughput of Hazardous Waste Incinerators.....	1707
Optimum Design of a Tee Mixer for Fast Reactions....	1773
Optimum Mixture Compositions for Measurement of Cross Virial Coefficients.....	1661
Oxygen Transport in Biofilm Electrodes for Screening of Toxic Chemicals .....	19

## P

Particle Generation in a Chemical Vapor Deposition Process with Seed Particles.	409
Partitioning and Adsorption of Aromatic Compounds on Microporous Silica Gel.....	1605
Percolation Theory of Creation and Mobilization of Foams in Porous Media.....	1176
Performance of a Cellulose Acetate Permeator with Permeability-Influenced Feed .....	1610
Pitch-to-Diameter Effect on Two-Phase Flow across an In-Line Tube Bundle .....	765
Platelet Interaction with Poly-(ethylene oxide) Networks.	994
Polymer Melt Devolatilization Mechanisms.....	1313

Prediction of Binary Overloaded Elution Profiles Using the Simple Wave Effect.	1722
Prediction of Differential Sorption Kinetics near $T_g$ for Benzene in Polystyrene .....	877
Prediction of Liquid Circulation in Viscous Bubble Columns .....	1339
Prediction of Slug Frequency in Horizontal Two-Phase Slug Flow.....	701
Principles of Dynamic Balancing.....	1321
Protein Partitioning in PEG/Dextran Aqueous Two-Phase Systems .....	1017

## R

Rationalization for the Molecular Weight Distributions of Coai Pyrolysis Liquids....	1189
Reaction Phenomena in a Nonthermal Equilibrium Plasma .....	1439
Reaction-Independence of Mixing Coefficients in Fixed-Bed Reactors, The....	1449
Reactor Analysis with Diffusion-Limited, Concentration-Dependent Deactivation.....	779
Restricted Diffusion through Granular Materials .....	242
Revised Vapor-Liquid Equilibrium Model for Multicomponent Formaldehyde Mixtures .....	1807
RF Plasma Synthesis of Amorphous AIN Powder and Films.....	871
Rigorous Dynamics and Feedforward Control Design for Distillation Processes.....	576
Robust Error-in-Variables Estimation Using Nonlinear Programming Techniques ..	985
Role of Micromixing in the Scale-Up of Geometrically Similar Batch Reactors, The.....	293
Route Selectivity for Gas-Liquid Flow in Horizontal T Junctions .....	805

## S

Selecting the Best Distillation Control Configuration .....	753
Selection of Secondary Measurement for Parallel Cascade Control .....	1267
Selective Catalytic Reduction of NO over Vanadia on Pillared Titanium Phosphate .....	794
Self-Consistent Local Composition Model of Electrolyte Solutions .....	370
Self-Propagating Solid-Solid Noncatalytic Reactions in Finite Pellets.....	1032
Sensitivity of Octane Number to Catalytic Cracking Rates and Feedstock Structure.....	1617
Separation Network Design Space, The .....	943
Shear Thickening (Dilatancy) in Concentrated Dispersions .....	321
Similarity between Flashing and Nonflashing Two-Phase Flows.....	797
Simple Process Equations, Fixed-Point Methods and Chaos.....	641
Simultaneous Synthesis of Mass-Exchange and Regeneration Networks .....	1209
Single Effective Diffusivities for Dynamic Adsorption in Bidisperse Adsorbents .....	302
Solid-Liquid Mass Transfer in Packed Beds with Cocurrent Downward Two-Phase Flow .....	1444
Solubility Models for Amino Acids and Antibiotics .....	333
Solvent Expansion and Solute Solubility Predictions in Gas-Expanded Liquids.....	939
Sorbents for Removal of Lead Compounds from Hot Flue Gases.....	307
Spatial Instabilities in the Regeneration of Diesel-Particulate Filters.....	353
Stability Analysis of Nonlinear Feedback Systems, The.	66
Stability of Multilayer Extrusion of Viscoelastic Liquids.	710

Statistical-Mechanical Model of Protein Precipitation by Nonionic Polymer.....	1517
Steady Laminar Round Jets of a Viscous Liquid Falling Vertically in the Atmosphere.....	738
Steady-State Multiplicity Caused by Nonideal Mixing in Two Isothermal CSTR'S.....	951
Stirring Characteristics in Bioreactors.....	1361
Stochastic Analysis of a Three-Phase Fluidized Bed: Fractal Approach.....	1529
Stress Distribution in a Packed Bed above Raceway Cavities Formed by an Air Jet ...	461
Structure of Plane Underexpanded Air Jets into Water.	818
Study of Multicomponent Adsorption Equilibria by Liquid Chromatography, A .....	275
Study of Restricted Diffusion in Porous Catalysts by NMR.....	559
Supercritical Extraction of Organic Mixtures from Aqueous Solutions.....	1743
Synthesis of Multivariable Nonlinear Controllers by Input/Output Linearization.....	249

## T

Temperature and Saturation Effects on Diffusion of Carbon Dioxide through Tuff...	469
Theory and Experiments Concerning the Stability of a Reacting System in a CSTR.	961
Thermal Integration of Homogeneous Azeotropic Distillation Sequences .....	969
Thermodynamics of Lewis Acid-Base Mixtures.....	1851
Thermoflow Multiplicity in a Cooled Tube .....	397
Transition Electrolyte Concentrations for Bubble Coalescence.....	1425
Transport of Aromatic Molecules in NaY Zeolite Powders .....	1562
Turbulent Mixing with Multiple Second-Order Chemical Reactions .....	1457
Two-Dimensional Analysis of a Dust Explosion.....	1087
Two-Dimensional Model for the Free-Settling Regime in Continuous Thickening, A..	1545
Two-Dimensional Numerical Study of Cross-Flow Filtration Combustion .....	1649

## U

Ultrapurification of SiCl <sub>4</sub> by Photochlorination in a Bubble Column Reactor.....	216
Unified Thermodynamic Analysis of Sorption in Rubbery and Glassy Materials..	1505
Unifying Indicator and Instantaneous Reaction Methods of Measuring Micromixing.	227
Upgrading of Solvent Extracted Athabasca Bitumen by Membrane Ultrafiltration.....	1279

## V

Vector Processing Strategies for Chemical Process Flow-sheeting.....	1687
Viscoplastic-Elastic Modeling of Tubular Blown Film Processing.....	420
Viscosity Effects in Cocurrent Three-Phase Fluidization ...	1613
Viscosity of Mixtures of Diatomic Fluids Using Nonequilibrium Molecular Dynamics.....	948

## W

Wave Propagation in the Flow of Shear-Thinning Fluids Down an Incline.....	1873
--	------